

## CASE REPORT

# Rare case of heart failure caused by compression of the left atrium by a thoracic aortic aneurysm

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A 61 year old patient was found to have an aneurysm extending from the aortic root to the suprarenal region. He underwent first stage surgery with aortic root and arch replacement, prosthetic aortic valve replacement, and coronary artery bypass grafting. Four weeks later, he presented with breathlessness and signs of heart failure and pleural effusion. Computed tomography showed that the left atrium was compressed between the aortic aneurysm posteriorly and the left ventricle and sternum anteriorly. Obstruction of the superior vena cava, bronchus, oesophagus, and rarely right atrium by an aortic aneurysm has been described before but presentation with left atrial compression has not been reported.

**A**ortic aneurysm may present catastrophically with dissection or rupture or chronically with symptoms from compression of the surrounding structures. Compression of the bronchus, oesophagus, and vertebra is well described and there have been isolated case reports of dissecting aneurysm of the thoracic aorta presenting as right atrial obstruction.<sup>1</sup> We describe a rare case of aortic aneurysm that caused congestive heart failure from compression of the left atrium.

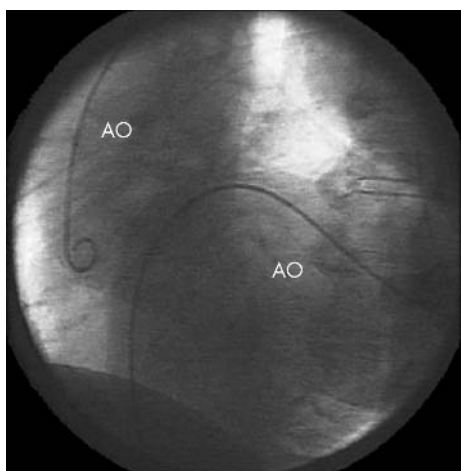
## CASE REPORT

A 61 year old man presented with upper back pain and exertional dyspnoea. He had been treated for hypertension and non-insulin dependent diabetes for many years. Clinical examination found signs of aortic regurgitation with a corresponding blood pressure of 136/60 mm Hg. This was

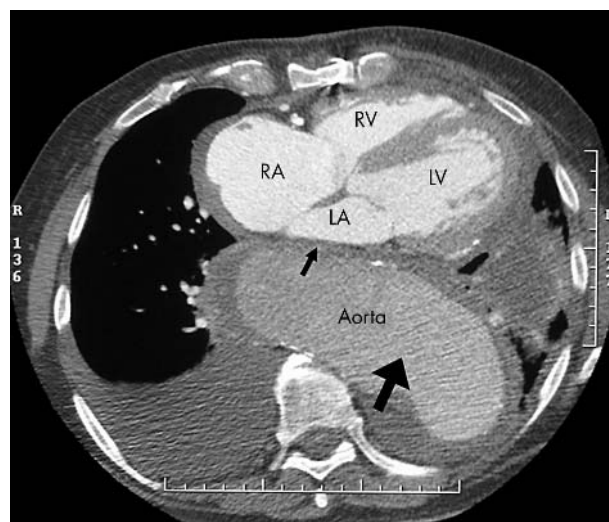
confirmed by echocardiography, which also showed normal left ventricular systolic function. The chest radiograph showed a grossly tortuous and unfolded thoracic aorta, which was proved by subsequent computed tomography (CT) to be aneurysmal from its origin to just above the kidneys. The aorta had a maximum calibre of 6.7 cm. Coronary angiography was performed through the brachial artery, as standard catheters were too short for a femoral approach in this patient (fig 1). This showed severe aortic regurgitation and stenosis in both the left anterior descending and the right coronary arteries.

The patient underwent first stage surgery in a different centre with ascending and total aortic arch replacement, prosthetic aortic valve replacement, and coronary artery bypass surgery, with a left internal mammary graft to the left anterior descending artery and a venous graft to the right coronary artery.

He remained well for four weeks but was then readmitted with breathlessness and was found to have a pleural effusion, which was drained by intercostal tube. His echocardiogram showed a normally functioning aortic prosthesis and left ventricular function. He remained symptomatic in spite of pleural fluid drainage. Examination disclosed increased central venous pressure and peripheral oedema. A diuretic was therefore commenced. The presumptive diagnosis was diastolic left ventricular dysfunction but we were concerned that he might have had thromboembolic pulmonary hypertension. Right heart catheterisation, however, disclosed a



**Figure 1** Aortogram done with a pigtail catheter in the ascending aorta, showing a severely dilated and tortuous aorta.



**Figure 2** Axial computed tomography at the level of the ventricles shows the aneurysmal descending aorta crossing the midline posteriorly (thick arrow), displacing the heart anteriorly, and compressing the left atrium (thin arrow). The right atrium is enlarged and there is a moderately sized right pleural effusion.

pulmonary artery pressure of 55/26 mm Hg (mean 43 mm Hg) and pulmonary capillary wedge mean pressure of 21 mm Hg. The right atrial mean pressure was 16 mm Hg. CT of his chest showed that the aneurysmal descending thoracic aorta was displacing his heart anteriorly and compressing the left atrium (fig 2).

While awaiting the second stage of his surgery for repair of the descending aorta, he suddenly collapsed and died of rupture of the aortic aneurysm.

## DISCUSSION

Our patient's presentation with heart failure was puzzling in the context of his normally functioning prosthetic valve and left ventricle. Cardiac catheterisation disclosed an increased pulmonary capillary wedge pressure and CT showed compression of his left atrium by the aortic aneurysm. We believe that this compression resulted in partial obstruction of the chamber, increased the pressure (reflected in the pulmonary capillary wedge pressure), and led to the development of congestive heart failure.

Compression by an aortic aneurysm of the superior vena cava, bronchus, oesophagus, and rarely the right atrium<sup>2-4</sup> has been described previously. We believe this case is the first description of a patient with congestive cardiac failure caused by compression of the left atrium.

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